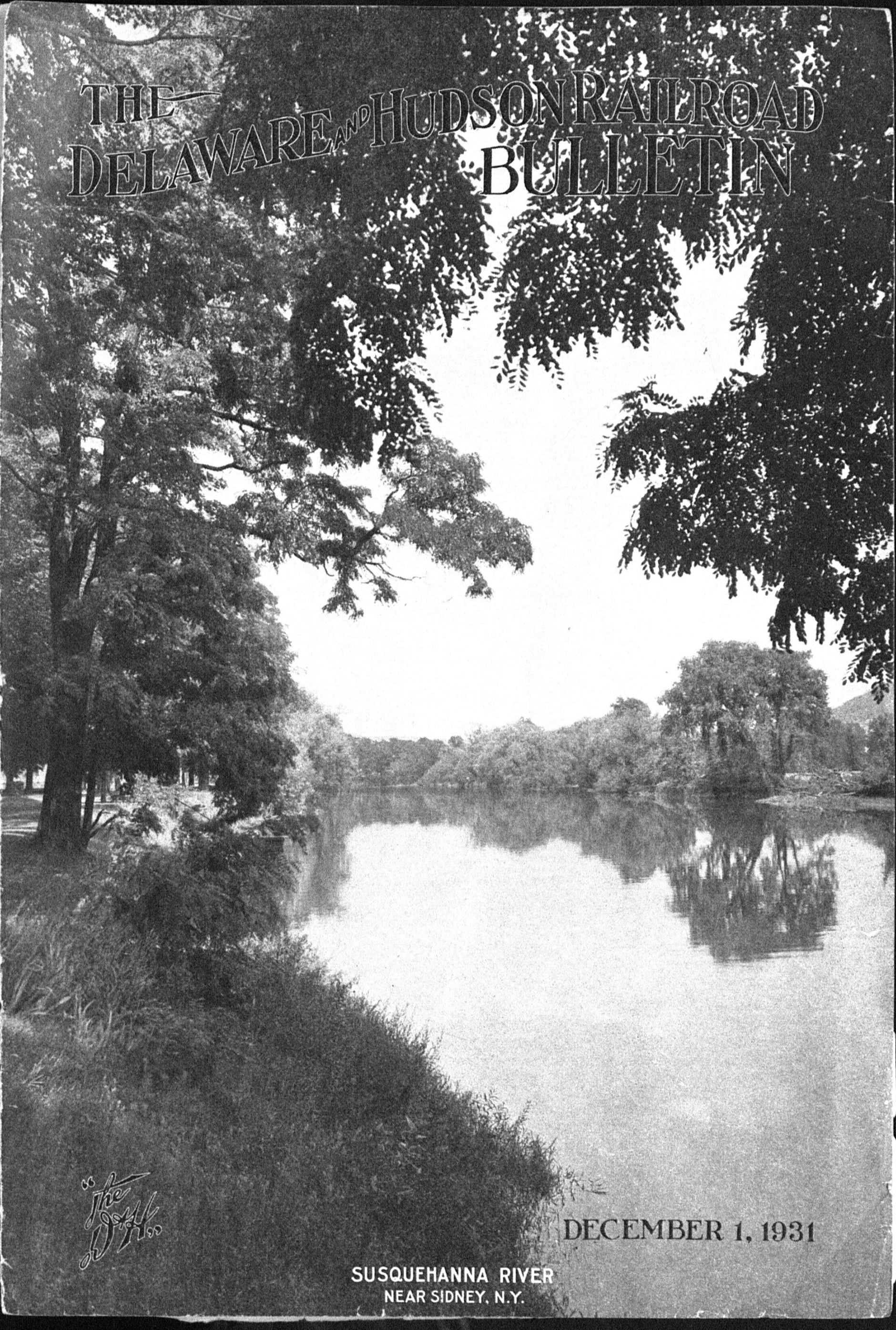
THE DELAWARE AND HUDSON RAILROAD BULLETIN



"The D&H"

DECEMBER 1, 1931

SUSQUEHANNA RIVER
NEAR SIDNEY, N.Y.

Friendly Obstacles

FOR every hill I've had to climb,
For every stone that bruised my feet,
For all the blood and sweat and grime,
For blinding storms and burning heat,
My heart sings but a grateful song—
These were the things that made me strong!

For all the heartaches and the tears,
For all the anguish and the pain,
For gloomy days and fruitless years,
And for the hopes that lived in vain
I do give thanks, for now I know
These were the things that helped me grow!

'Tis not the softer things of life
Which stimulate man's will to strive;
But bleak adversity and strife
Do most to keep man's will alive.
O'er rose-strewn paths the weaklings creep;
But brave hearts dare to climb the steep!

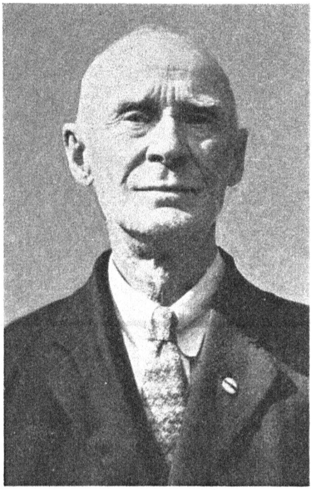
—L. E. THAYER.

The
DELAWARE AND HUDSON RAILROAD
CORPORATION
BULLETIN

Engines Like Watch Charms

Recalled by Retired Locomotive Carpenter

"TO sum up, briefly, the growth of the locomotive during the past fifty years," says retired Locomotive Carpenter JOSEPH H. BRIERLY, "it might be said that the first engines I worked on at Green Island were like watch charms compared with the motive power of today." In the last half century MR. BRIERLY worked on practically every Delaware and Hudson locomotive.



JOSEPH H. BRIERLY

After completing his schooling in his home town, Cohoes, N. Y., JOSEPH went to work as a loom operator in the Harmony Mills in that city where his father was an overseer. There were hundreds of looms weaving cotton cloth, all driven by huge water wheels. With a little experience he was able to operate ten looms at one time. When one stopped it was his duty to find the cause and remedy it: sometimes it was a broken thread, a defect in the machinery, or a broken belt. For his services he received from $3.50 to $4 per week; women weavers were paid even less.

Today, in the same mills, a single weaver tends as many as twenty or twenty-four looms for which he receives more for a day's work than MR. BRIERLY was paid in a week.

For ten years JOSEPH operated looms before becoming a loom repairer, which position gave him a slight increase in salary. As there was little hope of further advancement in the mills, he resigned to enter the employ of a building contractor as a carpenter.

Two years later MR. BRIERLY applied for and received a position as carpenter in the Delaware and Hudson locomotive shop at Green Island under Foreman Robert Patterson. John L. Cory was then Master Mechanic of the Division.

It was MR. BRIERLY'S duty to keep locomotive pilots, tender frames, and cabs in repair, as well as to take care of any other carpentry work in or about the shop. In return he received what was then "big pay"—$2 a day.

One incident which stands out in his memory came as an aftermath of a collision between a light engine and a trolley car at North Troy. The following day he was told to clean up the engine and make an itemized list of the repairs necessary to put it back in shape. While inspecting the cab he came across two hat pins which he has preserved to the present time.

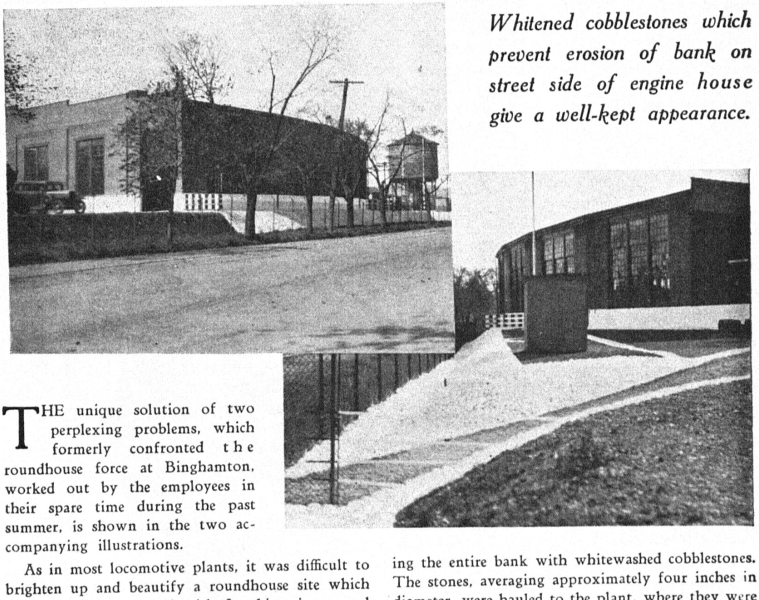
On September 21, 1878, MR. BRIERLY, then eighteen years of age, joined the Chadwick Guards, a company of infantry stationed at Cohoes. He continued as a guardsman for ten years, until December 12, 1888, when he was honorably discharged.

The night that the famous "blizzard of '88" set in, MR. BRIERLY and another Delaware and Hudson man started for home in Cohoes on foot because all trolley service was crippled. At first they decided to take a short cut through a wood south of Cohoes but turned back with the coming of darkness. Another less fortunate workman was found the next day frozen to death in the same wood almost within calling distance of his home.

When the locomotive shop was moved from Green Island to Colonie, in 1913, MR. BRIERLY was transferred to Colonie where he completed his 45 years in Delaware and Hudson employ. At the end of that time he was forced to retire because of failing health.

MR. and Mrs. BRIERLY, who are now at home at 117 Johnson Avenue, Cohoes, N. Y., have two children: a son Alexander owns a restaurant in Cohoes, and a daughter, Mrs. Frank Sherman, lives in Schenectady.

Binghamton Roundhouse Dresses Up



Whitened cobblestones which prevent erosion of bank on street side of engine house give a well-kept appearance.

THE unique solution of two perplexing problems, which formerly confronted the roundhouse force at Binghamton, worked out by the employees in their spare time during the past summer, is shown in the two accompanying illustrations.

As in most locomotive plants, it was difficult to brighten up and beautify a roundhouse site which is periodically showered with fine bituminous coal cinders from locomotive smokestacks. More difficult of solution, however, was the problem of anchoring the cinder bank on the Broad Avenue side of the plant, which was washed out by every heavy rain.

Two birds were figuratively killed with one stone when someone happily hit upon the plan of covering the entire bank with whitewashed cobblestones. The stones, averaging approximately four inches in diameter, were hauled to the plant, where they were closely fitted together by the employees in their spare moments during the summer. They were then painted, giving the roundhouse a bright white setting.

Proper drainage was further insured by forming gutters of cobblestones leading to manholes and street sewers.

New Lamps for Old

By Arthur D. Little

(Continued from last issue)

IN 1791 the French chemist, Le Blanc, invented a process for making caustic soda and sodium carbonate from common salt, thus giving the world for the first time a cheap and abundant supply of alkali. He started operations in a factory which was soon thereafter confiscated by the Committee of Public Safety. As a most deplorable consequence Le Blanc died by suicide in a French poorhouse. Fortunately, his process long outlived him and became the foundation of the great British alkali industry with its many ramifications and by-products.

Stephenson's locomotive, which was going to lower the price of oats, and which was preceded by a man carrying a red flag; Fulton's steamship and Ericsson's "Monitor" were all objects of ridicule to their contemporaries, although Lincoln's comment when shown a model of the "Monitor" was, " 'I think there's something in it,' as the pretty girl said when she drew on her stocking."

In 1804 the British Admiralty declared it their duty "to discourage the employment of steam vessels as...........the introduction of steam vessels was calculated to strike a fatal blow to the naval supremacy of the Empire."

When, in 1815, Samuel Baldwin Rogers realized the great proportions to which the English railway system was destined to expand, he submitted to prominent engineers detailed plans for the construction of one thousand miles of railroad. He was laughed at. He was called a "dreamer." His suggestions were those of a "madman" and impossible of adoption. Yet before Rogers died he had seen between four and five thousand miles of rail laid down.

Here, in America, we have, upon the whole, been kindly disposed toward inventors. They have in general fared better with us than saints have fared elsewhere in the world, but our recognition of them has often been strangely and long delayed. Samuel F. B. Morse conceived his telegraph in 1832. He struggled for 12 years in extreme poverty before the Washington-Baltimore line was built, though he had demonstrated his system in 1837, and during that long period he was rebuffed and ridiculed.

Charles Goodyear was another martyr to a great discovery. In 1830, when Goodyear set out to improve them, the "gum shoes" and other clumsy goods made of raw rubber had little to recommend them. They softened with heat, were often sticky, and always liable to mildew.

For ten years of dire poverty Goodyear tried every conceivable way to overcome these fatal objections and convert rubber into a material of broad utility. At last, in 1839, he had the happy accident which revealed to him the process of vulcanization as he picked up the little ball of rubber and sulphur which he had inadvertently dropped on the hot stove. It was two years more before anyone could be induced to back the discovery with money. He was harassed by patent suits. He tried unsuccessfully to introduce the invention in England. The French company which he did form failed, and Goodyear was imprisoned in Paris for debt. He died a poor man in 1860 in New York.

Coming down to our own contemporaries, we find Selden, the inventor of the gasoline-propelled automobile, striving vainly for years to interest capital in the building of his "horseless carriage." His proposals were received with scoffing and derision. Although his application was filed in 1879, it was 16 years before he could secure its allowance as a patent, and, to enforce his claims, he was, thereafter involved in long and expensive litigation. All in all, it is doubtful if Selden received a return of as much as a cent for the automotive vehicles in which his invention has been embodied, though out of every family dollar 11 to 12 cents is spent for motor cars.

We are pleased to believe today that we know a good thing when we see it, but Charles F. Kettering, President of General Motors Research Corporation, tells us that he has to pick good ideas out of the waste basket at least six times before he can secure their adoption.

Ever since the wax melted in the wings of Icarus as he soared toward the sun, proposals for human flight have been received with suspicion and distrust, which, in these later days have been intensified by the fate of Darius Green and his Flying Machine. It is, perhaps, not surprising, therefore, that Langley, who attacked and solved many of the problems of aeronautics as a scientist, died humiliated and crushed by public disdain; that Wilbur Wright during the days of preparation for his amazing flights at Paris was caricatured as "*Le*

Bluffeur Wright," or even that the nation's idol, Lindbergh, was once called "The Flying Fool."

It would be an interesting study to trace the origin of old prejudices. Many people used to believe that tomatoes caused cancer. Today the tomato and its frequent associate, lettuce, are recognized as among the most important sources of the vitamins A, B, and C, which are so essential to nutrition and health.

The introduction of the potato in Europe met with great resistance, and the controversy was raging 150 years ago. Cobbett in England asserted that anyone who advocated their cultivation was not a patriot. The small farmers and peasants had often to be bribed before they could be induced to grow and use potatoes, so hard is it to change agricultural and food habits.

It might be supposed that the importance of pure food would be recognized, even by Congressmen, without argument. Dr. Harvey W. Wiley learned otherwise. The first pure food bill was introduced in Congress in 1889. Others followed at frequent intervals, but for 17 years their passage was prevented. Not until 1906 did Dr. Wiley win his fight and the President sign the Food and Drugs Act.

Although prejudice and fundamentalism still shackle thought in many fields and great peoples are encased in the shell of habit and custom, the world is now undoubtedly more tolerant of new ideas than in the past. The public, bewildered by the magic of the laboratory, is even too ready to accept any marvel from science, however inaccurate its sensational presentation in the press may be.

Invention on many lines, is now an organized industry conducted in the research laboratories of great corporations whose executives are alert to utilize each new development. The solitary inventor, nevertheless, still travels painfully and far to exchange his lamp. He, or his friends, must provide the money for development before he can show that "basis for credit and record of earnings" which High Finance demands.

In reviewing the difficulties surrounding the exchange of new lamps for old, one is forced to the conclusion that Authority, if not indeed blind, like Justice, is at least myopic. With monotonous repetition the new has been rejected by those presumably best qualified to appraise its worth. Far too often has their decision been confirmed by ignorance and self-interest. Caution and conservatism have their place and value, but they would hold us where we are. Progress comes only through imagination sustained by faith. Fortunately, great ideas live on through many reincarnations and ultimately prevail.

We, ourselves, are living in a time of ferment and upheaval when it is more necessary than ever before to "prove all things; hold fast to that which is good." Let us then conduct our proving with an open mind lest that which is good escape us, and if we ourselves are privileged to carry a message of truth and leading let us say, with Browning in "Paracelsus":

> "I press God's lamp
> Close to my breast; its splendor, soon or late
> Will pierce the gloom: I shall emerge one day."

"The Lesson of the Day"

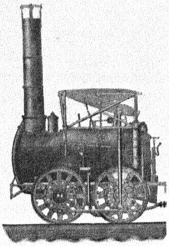
IT is a gloomy moment in history. Not for many years—not in the lifetime of most men who read this publication—has there been so much grave and deep apprehension; never has the future seemed so incalculable as at this time. In our country there is universal commercial prostration and panic, and thousands of our poorest fellow citizens are turned out against the approaching winter without employment, and without the prospect of it.

In France the political caldron seethes and bubbles with uncertainty; Russia hangs, as usual, like a cloud, dark and silent upon the horizon of Europe; while all the energies, resources and influences of the British Empire are sorely tried, and are yet to be tried more sorely, in coping with the vast deadly insurrection, and with its disturbed relations in China.

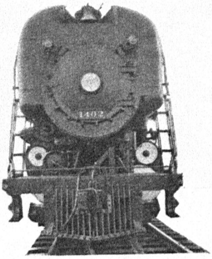
It is a solemn moment, and no man can feel an indifference (which, happily, no man pretends to feel) in the issue of events.

Of our own troubles no man can see the end. They are, fortunately, as yet mainly commercial; and if we are only to lose money, and by painful poverty to be taught wisdom—the wisdom of honor, of faith, of sympathy and of charity— no man need seriously to despair. And yet the very haste to be rich, which is the occasion of this widespread calamity, has also tended to destroy the moral forces with which we are to resist and subdue the calamity.

Good friends: Let our conduct prove that the call comes to men who have large hearts, however narrowed their homes may be; who have open hands, however empty their purses. In time of peril we have nothing but manhood, strong in its faith in God, to rely upon; and whoever shows himself truly a God-fearing man now, by helping wherever and however he can, will be as blessed as a great light in darkness.—*Harper's Weekly*, October 10, 1857.



American Locomotive Development



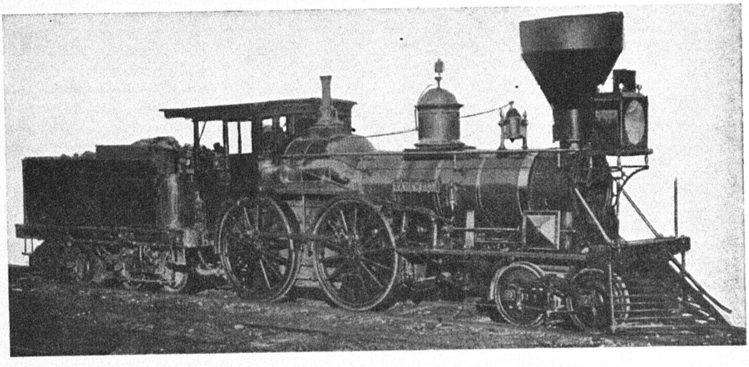
As Typified by Delaware and Hudson Motive Power

FIRST to introduce the steam locomotive in this country, The Delaware and Hudson is still pioneering in the field of experimental design of motive power. The story of the development of its locomotives from the *Stourbridge Lion* to the *James Archbald* is, essentially, the story of the development of American motive power.

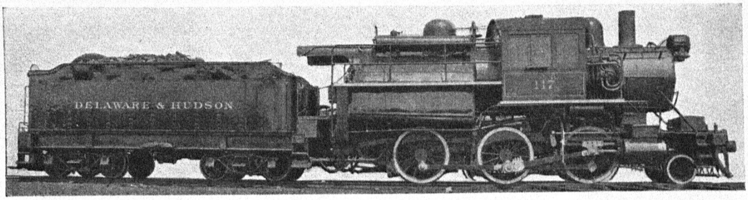
Just what the capabilities of the *Stourbridge Lion* would have been, had it not exceeded the weight limitations imposed by the creaking wooden trestles of the old Gravity Road, will never be known, as the *Lion* was never given an opportunity to pull a load. Some idea of the prowess of the "giants" of a century ago may, however, be had from Stevenson's claim, about 1833, that his massive locomotives weighing 9 tons, could haul 100 tons at a speed of sixteen miles per hour. This figures out to 1600 "gross ton miles per hour" as compared with 43,000 which is an average performance between Oneonta and Mechanicville for the *James Archbald* (No. 1402), our most modern freight power, weighing 178 tons. How this wonderful improvement has been affected is a romance in itself.

Starting from the crude engine mounted on a four-wheeled chassis, weighing six tons, and with a steam pressure not to exceed 50 pounds per square inch, (These specifications were among those governing the "Rainhill" tests of 1829) the only limit which has not been increased is the height of the stack: in those days it was set at 15 feet, natural draft being necessary to get up steam, and it is even less to-day.

The first notable improvement over this early design was the construction of a "bogie" locomotive. (A "bogie" is a four-wheeled truck arranged



The "Farewell"—1853 (American Type)



Double-cab Mogul, called "Mother Hubbard" or "Camel-Back"

to swivel about a center- or king-pin in such a manner as to facilitate rounding curves; hence commonly referred to in roundhouse parlance as a "lead" truck.) The design of this engine was in accordance with the specifications of John B. Jervis, Chief Engineer of the Delaware and Hudson Canal Company, for operation on the Saratoga and Schenectady, now part of our lines.

It is recorded that this locomotive could do the work of 50 horses, its daily cost of operation being $15 against $50 for the horses. Despite this apparent economy it was not used in the winter months.

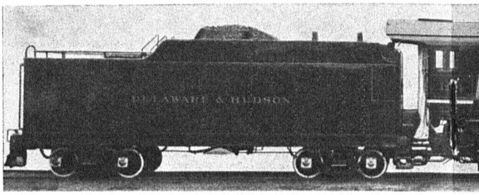
The first steam brake, patented by Stephenson in 1833, was the complement of the "bogie" truck. The truck permitted safe operation at high speeds, the steam brake being necessary, however, for controlling deceleration as desired, hand-brakes being inadequate.

In 1835 the Baldwin Locomotive Works built two locomotives for our company, the *Champlain* and the *Erie*. These are noteworthy because their steam pipes had ground joints instead of the canvas and red lead previously used. At this time, too, Mr. Baldwin patented the method of setting boiler tubes in the flue sheets by driving a copper ferrule on the outside of the end of the tube, thus making a tight joint. Practically the same method is in use to-day, nearly a century later.

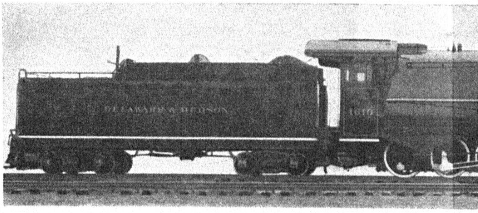
Mr. Baldwin's declaration, in 1838 that engines weighing 13 tons were as heavy as would be called for, has, obviously, been subject to subsequent revision!

In view of the complete reversal of the picture as it is now presented, we mention both Baldwin's statement and Stephenson's contemporary criticism of American railroads:

"I am sorry the feeling in the United States in favor of light railways is so general. In England we are making each succeeding railway stronger and more substantial. Small engines are losing ground and large ones are daily demonstrating that powerful engines are the most economical."



Heavy Consolidation Type



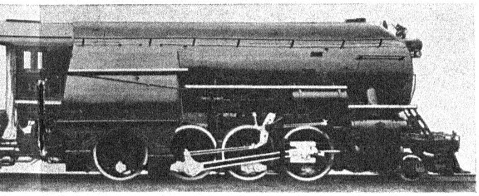
Mallet Articulated Compoun

The above refers to the 9-ton "monsters" previously spoken of in this article.

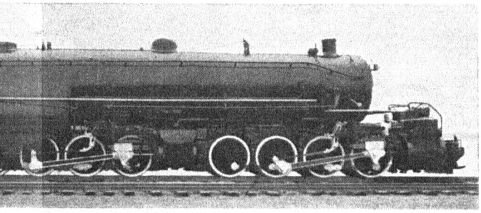
These "bogie" truck engines, such as the *Champlain* and *Erie* were of the 4-2-0 type. It was only natural that enlarged fireboxes necessitated the addition of more driving wheels, hence the 4-4-0 type, which for half a century was standard for passenger service and is still known as the "American" type.

At this same time, about 1845, the Stephenson Link Motion for controlling the admission and release of steam from the cylinders was introduced. Even to-day small locomotives use this valve gear, though it has been superseded on heavy power by "outside" gears of various types. One of the most satisfactory of these, the Walschaert, invented by a Belgian, was first brought out in this country on a Baltimore and Ohio Mallet locomotive when PRESIDENT LOREE was at the head of that road.

Illustrative of the difficulty of finding anything "new under the sun" is a photograph of the *Farewell*, built in 1853, in which the outside bearings on the engine truck axles, a design recently revived, show plainly. As the cylinders and main-rods were between the frames this is presumably the reason for the style of truck used. This engine carried a boiler pressure of 100 pounds per square inch and was one of the first locomotives owned by the Delaware and Hudson to have a Stephenson gear.



on Type Freight Locomotive



Compound for Heavy Grades

It was not until after the middle of the nineteenth century that coal was substituted for wood which had previously been used almost exclusively for locomotive fuel.

Between 1860 and 1870 the "Moguls" (2-6-0) came into prominence as freight power, eight being purchased by the Delaware and Hudson in that decade. These "monsters" had a steam pressure of 120 pounds and a tractive power of 14,160 pounds. This period is noteworthy because of the general introduction of steel in locomotive construction, especially for tires, fireboxes, and boiler shells.

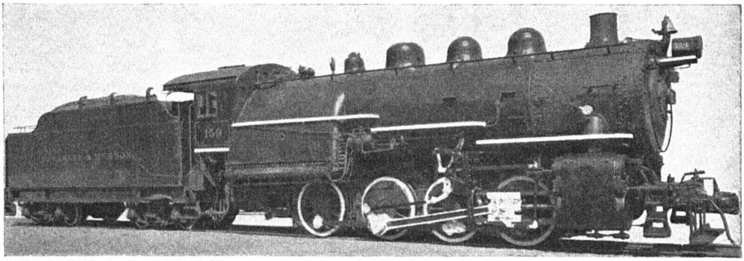
During the next decade two changes of major importance took place. One was the conversion of the Albany and Susquehanna Railroad from 6 feet to 4 feet 8.5 inch gauge, six locomotives being altered at a cost of $21,000. At this time, also, the wide firebox, designed by John E. Wooten, came into vogue on roads using anthracite for fuel, and it remains the Delaware and Hudson standard at the present time.

The adoption of this firebox at that time necessitated the use of the double-cab arrangement, whence engines of this type are referred to as "Mother Hubbards" or "Camel Backs," a very comfortable and satisfactory arrangement which is now being replaced by the single cab design, since the necessity for two cabs no longer exists.

The first "Consolidation" type (2-8-0) to be used on the Delaware and Hudson was not bought until 1882.

Although the first pneumatic brake, a vacuum type, was patented by James Nasmyth and Charles May in 1844, it was not until 1869 that George Westinghouse took out patents on his "straight air brake." In 1872 he patented the plain automatic brake, thus beginning another era in railroading.

By 1891 steam pressures of 145 pounds were in use on the Delaware and Hudson in freight locomo-



Heavy Switching Power, Converted from Consolidation Type tives of 16,900 pounds tractive effort. Within ten years 180-pound pressures were producing 41,450 pounds tractive effort and cylinders had increased from 18 by 24 to 22 by 28 inches.

Cast steel was extensively used for the first time by the Schenectady Locomotive Works in building three passenger locomotives for the Delaware and Hudson in 1895. The first radial-stayed boilers on our lines were on these three locomotives.

With the opening of the present century the principle of multiple expansion or compounding was being experimented with. Owing to faulty design and low standards of maintenance then prevailing, these experiments were unsuccessful. The factor which probably most seriously affected early attempts at compounding was the introduction of the superheater, by means of which it was possible to obtain the increased economy sought in the compound design, at a very greatly reduced cost. Had the steam pressures and temperatures in use to-day been available at the time that these earlier experiments with compound locomotives were being carried on, it is probable that the results might have been quite different, however.

Considerable development work followed the construction in 1903 of the first "smoke-box" type of superheater. The first American attempt at superheating is presumed to be that of the Chicago, Burlington, and Quincy, in 1878, which proved unsuccessful and was soon abandoned. Later attempts resulted eventually in the design of the "Schmidt" superheater from which the prevailing types of the present day were derived. It was not, however, until 1911 that superheaters were applied to Delaware and Hudson engines when the 1600-class Mallets were built.

The first American Mallet was built in 1904 at the behest of Mr. L. F. Loree, then President of the Baltimore and Ohio Railroad. This giant, weighing over 150 tons, was exhibited at the Louisiana Purchase Exposition as the largest locomotive of its time. Nearly all road locomotives of the more important classes are now equipped with superheaters.

The "Pacific" type (4-6-2) appeared with the turning of the century mark, a Baldwin engine of this design built for the New Zealand Government Railways being the original of the type now generally used for medium heavy passenger service. Conditions on our lines did not necessitate resorting to this type of power until 1914 when ten locomotives of the 600-class were ordered to cover the Montreal service.

Increasingly powerful "Consolidation" type freight locomotives has meanwhile been purchased as required, the "1200" class, weighing 148 tons, and having 67,150 pounds tractive power dating from 1916-18.

(To be Continued)

Nerve O. K.

Into a druggist's shop came a woman with a bottle which she handed to the proprietor.

"Is this all right to take," she asked.

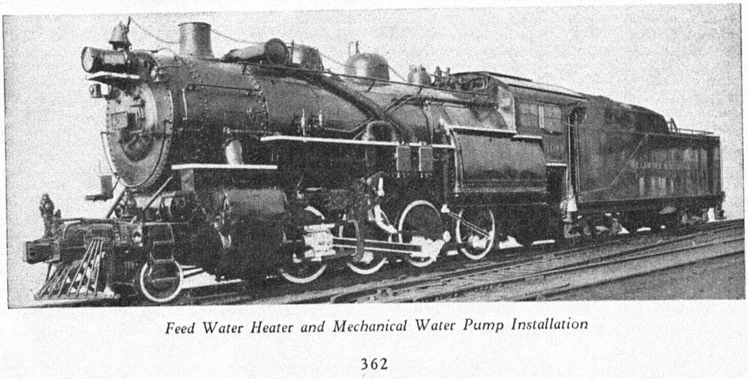
The chemist carefully inspected the bottle.

"You didn't buy it here," he said politely.

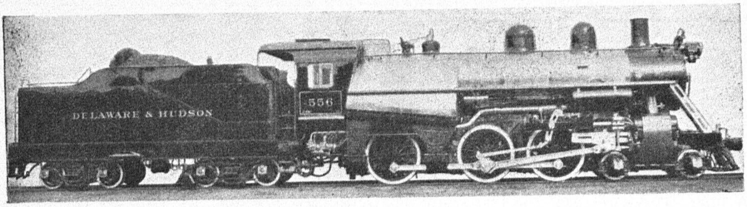
"On, no. It's a nerve tonic I saw advertised, but I thought you'd tell me whether I ought to take it:"

The chemist handed the bottle back.

"I don't think," he replied, "there is any necessity for you to take it. There is nothing wrong with your nerve."



Feed Water Heater and Mechanical Water Pump Installation



Ten-Wheel Passenger Locomotive

Life Insurance

Benefits Paid on Twenty four Claims Average $2,240.25.

WHILE nothing can replace a loved one lost, hardship is avoided for his family if the deceased person has been prudent enough to insure against this emergency. Such, fortunately, was the case with the 24 Delaware and Hudson employees who passed on in September and October, their beneficiaries receiving an average of $2,240.25 in Group Life Insurance within a few days after each death was reported.

The beneficiary of one employee received the balance of the Life policy due after the insured party had received Total and Permanent Disability benefits for a number of months. In three instances double the face of the Life Insurance policy was paid under the Accidental Death and Dismemberment option. The beneficiaries of two policies received an additional $3,000 under the Special Plan for Enginemen.

The distribution of this $58,087 total Life Insurance payment was made as follows:

NAME	OCCUPATION	LOCATION	DATE DIED	AMOUNT
Bourdo, Henry C.	Air Brake Inspector	Rouses Point	9-11-31	***$ 753
Brenner, Edward J.	Freight Agent	Wilkes-Barre	10-10-31	3,400
Carmody, William H.	Engineman	Binghamton	8-21-31	**6,000
Collins, John H. (P)	Engineman	Whitehall	9-5-31	**6,600
Davidson, William H.	Foreman	Rouses Point	8-23-31	3,000
Donellan, Joseph F.	Master Mechanic	Colonie	8-29-31	4,800
Dunn, Michael	Trackman	Port Henry	10-12-31	1,000
Empey, Charles F.	Conductor	Ticonderoga	10-6-31	1,000
Fitch, Howard T. (P)	Fireman	Carbondale	10-5-31	1,800
Foy, Samuel, Sr. (P)	Handyman	Rouses Point	10-10-31	1,400
Isger, Joseph H.	Engineman	Carbondale	10-21-31	**6,200
Kitchen, Charles F.	Assistant Foreman	Oneonta	10-6-31	2,600
Mangan, John H. (P)	Conductor	Binghamton	9-4-31	1,000
Mastro, Angelo	Car Repairer	Oneonta	10-25-31	1,600
Naatz, Charles F. (P)	Pump Runner	Castleton	9-11-31	500
Paralla, Thomas	Crossing Watchman	Mechanicville	9-8-31	1,000
Quick, Dexter	Engineman	Carbondale	9-10-31	***4,534
Read, Minnie A.	Asst. Hd. Comptr. Opr.	Albany	9-25-31	1,400
Rigle, Jake	Laborer	Carbondale	9-3-31	1,000
Root, Emerson J.	Trainman	Whitehall	10-19-31	1,600
St. Louis, Frank, Sr.	Trackman	Plattsburgh	10-14-31	1,000
Traver, Elias B.	Trackman	Gansevoort	9-17-31	1,000
Williams, George	Trainman	Lanesboro	7-24-31	500
Wood, Worley R.	Trainman	Oneonta	9-16-31	4,400
			Total	$58,087

(P) Denotes pensioned employee.
* Includes payment under Accidental Death and Dismemberment Insurance.
** Includes payment under $3,000 Special Insurance for Enginemen.
*** Represents balance due at death, employee having received payments under claim for Total and Permanent Disability Insurance.

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They Didn't Know!

SINCE December, 1930, 42 clippings from newspapers in New York State have been received at the State Department of Health which have recorded deaths from breathing automobile exhaust gases in closed garages. Additional clippings have told how 43 people narrowly escaped asphyxiation from the same cause. Doubtless these figures represent but a small proportion of the citizens in this State who lost their lives or have been made ill during the same period through inhaling the deadly carbon monoxide gas in the fumes that pour from the exhaust pipe of every running automobile engine.

Perhaps it may help to impress people with the dangerous nature of exhaust gases if facts given in a few of the stories are repeated.

In order to charge a depleted battery, an automobile was left running in a closed private garage which was underneath a bedroom. Result: two children and their mother were made seriously ill before the danger was discovered. Prompt action in getting them into the open air saved their lives.

In another case, a man went into his garage to fix a vacuum type windshield wiper which had not been operating properly. While adjusting it the owner evidently started the motor without opening the garage doors. He must have dropped unconscious without any warning of disaster for his pliers were still in or near his hand when the body was found. An inhalator was used without success.

A nightly habit of running the motor of his car a short time to keep it from freezing was responsible for the death of a man last winter in a closed garage. He evidently could not get to the outside air before being overcome.

Sometimes the wind is responsible for closing garage doors not properly fastened open. Several cases have been noted where this may have happened while the car operator was still in or near his car.

Apparently it isn't even necessary for all garage doors and windows to be closed for a fatality to occur. In a certain fatal case, one of the two garage doors was open. The supposition is that the wind blew the exhaust gases back into the garage. In another instance, where the garage doors were slightly ajar, the car operator realized he was being overcome and rushed into the open air before he dropped unconscious.

If a person is beneath the car with his head near the exhaust pipe and the motor running, he may be overcome, even if the doors are wide open.

REMEMBER carbon monoxide gas acts almost instantly and without warning. By the time a person realizes that something is wrong he is so far overcome that he usually loses consciousness before he can reach the open air.

Pickpockets

WHEN a member of the French Foreign Legion was caught stealing, an effective punishment awaited him: A needle-pointed rapier was thrust through the palms of his hands as a punishment and deterrent to him, and a warning to others.

No such certain punishment awaits the thief in America. Criminals are seldom apprehended, rarely identified, more rarely convicted, and most rarely kept in the penitentiary when sent there—all of which operations are troublesome and costly to the taxpayers.

With the approach of the holiday season, when the streets, stores and public buildings are apt to be crowded a large part of the time, it is well to exercise the "ounce of prevention" to avoid becoming a victim of pickpockets or thieves.

Some simple rules are: Do not carry all your money or valuables in one pocket. Do not leave valuables unprotected in your home when going out. Keep your purse or wallet in an inside coat pocket. So far as is possible, avoid crowds, and by all means do not flourish a bank roll where people can see it. Keep a small amount of money handy for making purchases—in a pocket separate from that in which the majority of your funds are kept.

"Without Honor"

Few Americans are aware of the work of Jacob Perkins, prophet of high pressure steam, who generated it at 800 to 1400 pounds pressure in 1827, more than a century ago.

OVER a hundred years ago, in 1823, Jacob Perkins, an American born inventor, amazed the British engineering world with a series of remarkable experiments with high pressure steam. Steam at high pressures, varying between 800 and 1400 pounds per square inch, has for some time been used in stationary engines, although only comparatively recently was it first successfully used in the operation of a railroad locomotive.

Perkins developed a system in which cold water was suddenly injected into a boiler made of three-inch copper, which had previously been heated to the highest temperature attainable with a forced draft. As early as 1827 Perkins produced working steam pressures of from 800 to 1400 pounds per square inch with his apparatus.

Similar experiments were carried out with another boiler consisting of a series of cast-iron bars, five inches square, each perforated longitudinally with a hole one and one-half inches in diameter. These bars were arranged in three tiers across the furnace; the lowest, maintained at a temperature of about 1,000 degrees F., contained no water. At each stroke of the engine a quantity of water was discharged through a check valve into this tier where it immediately flashed into steam.

Perkins naturally had great difficulty with cylinder lubrication in engines driven by high pressure steam. Eventually, however, he claimed to have overcome this by using a special alloy steel for the piston, which became so highly polished as to require no lubricant.

Another of his remarkable devices was a steam driven gun which he once demonstrated before the Duke of Wellington. With it he was able to fire steel balls through eleven one-inch planks placed one inch apart. He submitted a model of a steam machine gun to President Lincoln for use by the Union Army, although it was never used.

In 1837 Perkins presented a paper before the Institution of Civil Engineers in which he suggested the use of superheated steam—or "steam surcharged with caloric" as he expressed it—in locomotive boilers.

Among the inventions attributed to him were systems for securing free circulation of water in boilers, (which led to the development of the modern water tube boiler), warming and ventilating rooms, ventilating the holds of ships, and a method of fastening the seams of fire engine hose. Perkins also succeeded in compressing water by 1/11.5 of its volume under a pressure of 2,000 atmospheres, or 29,400 pounds per square inch. For the purpose of measuring the degree of compression he used an ingenious instrument of his own devising. Other inventions by Perkins included a bathometer for ascertaining depths, and a "plenometer" to indicate the speed of vessels moving through water.

Jacob Perkins' favorite realm, however, was that of engraving and printing, in which he first became prosperous and earned a degree of fame. While still a boy he had been employed by a goldsmith. When his empoyer died he successfully carried on the business, at the age of 15. This naturally led him to apply for and receive numerous contracts for making dies for copper coins, notably for the State of Massachusetts.

His next venture, which led him into considerable financial difficulty, followed his invention of a machine for cutting and heading nails in one operation.

He then entered the employ of a firm engaged in engraving. Because of the simplicity of the engraving used for printing bank notes, it was an easy matter for counterfeiters to ply their trade. The world was flooded with paper money, and although most European countries inflicted the death penalty for counterfeiting, this punishment had little deterrent effect.

Perkins therefore designed a method of engraving bank notes of which it is said that it was so complicated and difficult of imitation that a single note so made would cost the counterfeiter more than he could obtain by passing several hundred of them. Instead of using a single piece of copper for his cuts, Perkins fitted a number of pieces of highly polished steel together in an intricate design. They were then compressed to form a single "cut."

Facsimiles were produced in the following manner: A cylinder of soft steel, about three inches in diameter, was rolled to and fro across the engraved plate until the whole of the impression was seen on the cylinder in relief. The cylinder was then hardened, and rolled across a plate of copper or soft steel until a perfect facsimile of the original was produced, having practically the same sharpness of definition.

By varying the pattern of the numerous steel parts used in bank note "cut" under the Perkins system a variety of designs could be obtained. Consequently the State of Massachusetts passed a law compelling banks in that state to adopt the form of note invented by Perkins.

Mr. Perkins later went to England with the intention of bidding for the contract of printing notes for the Bank of England. Although he did not receive the contract in 1818, chiefly because he was "a late enemy of Britain," he set up a plant with 26 cases of imported American machinery and carried on a profitable business. His firm later produced over 22,000,000,000 penny postage stamps for England, in addition to stamps of other denominations, and bank notes.

Jacob Perkins, like many other inventors, paid the price for being ahead of his time. He was, in one respect, more fortunate than other inventors, however: several of the firms he established proved financially successful and he was able to retire at the age of seventy to spend his declining years in comfort and ease. These and other facts are contained in his biography by H. P. and M. V. Vowles, recently published in *Mechanical Engineering* under the title "Jacob Perkins, 1766-1849, A Study in American Ingenuity and Intrepid Pioneering."

Who Pays?

WHO pays for accidents?

We all pay for them. The injured person pays, the family pays, the community pays and industry pays.

The payments of the injured person and the family are highly personal, and many times tragic and permanent in effect.

The payments of the community and the payments of industry are more impersonal and hence frequently lost sight of.

In the cost to the community is reflected the direct cost to the injured person and to the family on the basis that each is a part of the community, and to this charge must be added a certain portion of the institutional expense that is properly charged against each accident.

Much has been written of the cost of accidents in industry. Discussion of the theme is particularly pertinent now, because of the general business depression. The cost of accidents becomes essentially a part of the cost of production, and the cost of production is vital to the welfare of the workmen and the community of which they are a part.

The cost of accidents to American labor, based on the total amount of wages lost by employees last year, reached the stupendous total of $1,204,000,000. Just where this enormous waste is charged is difficult to indicate in detail. However, it is well within the range of possibility to reduce all classes of accidents by 50 per cent, thus adding $600,000,000 to the purchasing power of the country's workers.

The ultimate effects of such a saving loom up in dramatic form. Additional homes would be built and owned; more automobiles purchased; more insurance carried; more students sent to schools and colleges; greater productive power added to industry through reduced turnover.

When one faces the situation in these terms, it is nothing short of an obligation to the individual employee, to the family and to the State to continue the fight for reduction of accidents and prevention of waste.—L. R. P. in *Erie Railroad Magazine.*

Troubled Times!

THE pessimist we shall have with us always, but we can well take his dire predictions with the proverbial "grain of salt." With this thought in mind it is interesting to note an excerpt from a recent address of Carl Gray, president of the Union Pacific System. Mr. Gray read this statement:

"The world is passing through troubled times. The young people of today think of nothing but themselves. They have no reverence for parents or old age. They are impatient of all restraint. They talk as if they alone knew everything, and what passes for wisdom with us is foolishness with them. As for girls, they are forward, immodest and unwomanly in speech and dress."

The speaker then amused and surprised his audience by crediting this statement to Peter the Hermit in the Twelfth Century! And what would "Ole Pete" have to say of our modern girls if he were alive today!—*De-Ce-Co Magazine.*

Generous

Mrs. Gordon—What'll we gie Tammie for a Birthday present? Last year he got a penny balloon.

Sandy—So he did—weel, he's been a guid laddie a' year so we'll let him blaw it up noo.

Clicks from the Rails

Automatic Mail Sorter

Cooperating with the Cleveland Crane and Engineering Company, the General Electric has perfected a system of sorting mail bags at rail terminals. The bags, each containing mail for a separate city, are placed on a belt conveyor which runs parallel with the tracks on which the mail cars are "spotted." Through the use of a photoelectric cell, the mail bags are automatically dropped near the car in which they are to go forward.

✣

Civics a la Carte

While sitting around a campfire talking on general topics someone in a group of hunters, among them President J. M. Davis of the Lackawanna, asked who could name the capitals of the 48 states. No one could do so. As a consequence Mr. Davis had the names, capitals, governors, and flowers of the states printed on the back of his dining car menus. This increased the "consumption" of menus considerably—very few people who noticed the information on the back of the bill of fare returned them to the rack.

✣

British Freight Cars

In England much of the freight equipment is privately owned and, since the cars are small, industrial plants frequently have privately owned side tracks coming up to a railroad at right angles, the junction being a small turntable on which cars are placed one at a time, turned and moved into the plant by man power!

✣

Shakespeare Express

On the "Shakespeare Express," from London to Stratford-on-Avon, a special label, showing the head of the famous playwright and poet, is provided for the passenger's luggage.

World's Fastest Train

The fastest train in the world at present is the Swindon-Paddington Express of the great Western (England) which covers 77.3 miles in 67 minutes, averaging 69.2 miles per hour from start to stop. This exceeds the Pennsylvania Railroad's time from Camden to Atlantic City, N. J., of 55.5 miles in 52 minutes or 64 miles per hour. The record holder has a number of near rivals in trains on the Canadian Pacific between Montreal and Toronto which run the 124 miles in 108 minutes or 68.9 miles per hour.

✣

Brakes on Rails

Brakes attached to the rails instead of to the undercarriage of railroad cars have been installed at the terminals of the twenty-four railroad lines entering the new Milan station in Italy. A train of fourteen coaches traveling 18 miles an hour was stopped within ten yards during tests.

✣

Long Rail Run Cut

The running time of trains making the longest railroad journey in the world, over the Trans-Siberian railroad, has been cut from eight to seven days. This run of over 5000 miles is nearly twice the width of the United States. Of equal interest is the advertised fact that meals are served in the dining cars on the "American Plan."

✣

Caboose has Bay Windows

Cabooses being turned out by the Baltimore and Ohio car shops have a bay window on either side instead of the usual cupola. Although some of the states through which the B. & O. operates require a cupola in cabooses, others do not, and it is hoped that the new type may become permissible even in the restricted states in the near future.

Bear Visits Roundhouse

Work was momentarily suspended in the Canadian National shops at Jasper, Alberta, recently when a large bear entered the roundhouse, and climbed up on the shafting to look around. This recalls the instance last winter when a deer made an inspection of our Carbondale yards and finally ended up in the turntable pit.

✣

Use Depot as Jail

The problem of the disposition of abandoned railway stations was solved in a unique way in one instance by the C. M. St. P. & P.—The railroad sold the Fond du Lac, Wisconsin, depot to the city for use as a jail while a new municipal building was being constructed.

✣

Birds' Nest

The crew of the *Rheingold*, a fast passenger train operating through the Rhine valley, in Germany, recently discovered a nest containing three redstarts underneath the baggage car. As they had been abandoned by their parents, the crew fed them until they were able to fly away.

✣

Shoots Albino Deer

Lawrence Provost, a Delaware and Hudson trainman, shot an albino or "phantom" deer weighing 300 pounds and having 18 prongs, in the Blue Ridge mountains on a recent hunting trip. Old timers assert that it means ill luck to kill a white deer. Provost also bagged two red foxes.

✣

Find Mastadon Tusk

While building the Illinois Central Railroad's line near Golconda, Ill., a mastadon tusk, fifteen feet long and nearly a foot in diameter, was found. It is on exhibition in the Centennial building at Springfield, Ill.

Capital

OUR country is classified as a capitalistic nation. It is unfortunate that the name "capital" has been so widely accepted, since it was given by antagonistic theorists who had specified formulae for community living. Capital represents the savings of civilization. It is a pooling of the resources built up by man as a seed-planting and saving animal. We commend the ants and the honeybees for storing up that capital which will carry them over through the seasons of little food and assure their reproduction. We should likewise commend ourselves for our capacity to live in all parts of the temperate and even arctic zone through artificial protection of ourselves from the climate and by proper storage of food and other supplies. Our wealth is represented by our savings.

—DR. RAY LYMAN WILBUR.